

# HERVEY BAY VETERINARY SURGERY

## Owner Information Series

### **HEART DISEASE - DILATED CARDIOMYOPATHY**

The heart has four chambers. The upper chambers are called *atria (auricles)*. One chamber is called an *atrium*, and the lower chambers are called *ventricles*. In addition to the upper and lower chambers, the heart is also considered to have a right and a left side.

Blood flows from the body into the right atrium. It stops there briefly, and then is pumped into the right ventricle. The right ventricle pumps blood into the lungs, where it receives oxygen. It flows from the lungs into the left atrium; it is held here briefly before going into the left ventricle. The left ventricle contains the largest muscle of the heart so the blood can be pumped out to all parts of the body.

### **WHAT IS DILATED CARDIOMYOPATHY?**

Dilated cardiomyopathy means that the heart muscle becomes unable to pump properly. The pressure of the blood inside the heart then allows this weakened heart muscle to stretch, resulting in a much larger left ventricular chamber. Therefore, the two characteristics of dilated cardiomyopathy are a heart wall that does not contract or pump normally and a chamber that is much larger than normal.

### **HOW COMMON IS DILATED CARDIOMYOPATHY?**

Dilated cardiomyopathy is not the most common cause of heart failure in dogs in general. However, this is the most common cause of heart failure in large breeds of dogs. Small breeds are only occasionally affected. The most commonly affected breeds are Boxers, Dobermans and Great Danes. Occasionally, medium sized breeds, notably Cocker Spaniels and English Springer Spaniels, and occasionally German Shepherd Dogs are also affected.

### **ARE THERE ANY SIGNS OF HEART FAILURE WHICH WOULD BE NOTICEABLE TO YOU?**

When the heart is not pumping properly, blood backs up into the vessels of the lungs. Increased pressure within the vessels results in small amounts of fluid leaking out of the capillaries and eventually into the air passage ways. This fluid collection in the lungs produces coughing and/or gagging, the most obvious sign of heart failure. Dogs in heart failure also tire very easily from minimal exercise.

Congestive heart failure begins when the heart is not able to pump blood with adequate oxygen to the tissues. Without adequate oxygen, the body's cells become desperate and trigger a series of responses. Various hormones are released by several organs in an attempt to correct the problem. These hormones conserve fluid in an effort to increase blood volume and the output of oxygenated blood by the heart. For a variable period, these compensatory responses help the situation. However, increased fluid retention eventually becomes harmful. More and more fluid leaks out of capillaries, causing increased gagging and coughing, and reduced stamina. Fluid may collect in the abdominal cavity and body tissues. Fluid in the lungs is called pulmonary oedema, fluid below the skin is called peripheral or limb oedema, and fluid in the abdomen is called ascites (dropsy). Congestive heart failure is a common cause of these signs.

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### **YOUR DOG HAS ONLY BEEN ILL JUST IN THE LAST DAY OR TWO. HOW CAN THIS HAPPEN?**

The signs of dilated cardiomyopathy may have a very sudden onset. Some dogs go into severe heart failure in what appears to be a matter of hours. Rapid, heavy breathing, a blue tongue, excessive drooling, or collapse may be the first signs.

### **WHAT TESTS ARE DONE TO ASSESS THE SITUATION?**

There are several tests that are used. All provide valuable information while looking at different aspects of heart function.

1. **Listening with a stethoscope (auscultation).** This valuable tool allows us to identify murmurs, their location, and their intensity and an abnormal heart rhythm (arrhythmia or dysrhythmia). It also allows us to hear lung sounds; this aids in our understanding of what is happening within the lungs.
2. **Chest radiographs (x-rays).** These give us the best look at the lungs and a view of the size and shape of the heart. In most cases, dilated cardiomyopathy causes tremendous enlargement of the heart. These changes are usually very apparent on the x-rays.
3. **Ultrasound examination (Echocardiogram, ultrasonography).** This examination uses sound waves which bounce off the structures of the heart and are read on a TV-like monitor. It gives the most accurate determination of the size of each heart chamber, and permits measurement of the thickness of the heart walls. This is seen on the monitor in actual time so the contractions of the heart can be evaluated. Certain measurements can be taken which allow the actual strength of the heart's contraction to be measured as a number and compared to the normal animal. Ultrasound may not be available in all veterinary practices because of the additional training needed to learn how to perform the examination and because of the cost of the sophisticated equipment.
4. **Electrocardiogram (ECG).** This is an assessment of the electrical activity of the heart. It allows us to accurately determine heart rate and to more accurately identify any abnormalities of rhythm that may be present.

The combination of all of these tests gives us our best evaluation of the dog and his/her heart function. However, if cost considerations prohibit us performing all of them, two or three will provide much valuable information.

### **IS THERE A TREATMENT FOR HEART FAILURE CAUSED BY DILATED CARDIOMYOPATHY?**

If the dog has a sudden onset of heart failure, rapid administration of the proper drugs is essential to survival. The following drugs may be used at various stages of treatment.

1. **Diuretics.** These drugs stimulate the kidneys to remove excess fluid from the body. Frusemide is most commonly used, although others will be selected in certain circumstances.
2. **Enzyme blockers.** This is a relatively new class of drugs which can directly block the compensation system that has gone out of control.

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3. **Vasodilators.** These drugs dilate the arteries and/or the veins of the body so that the heart doesn't have to generate as much pressure to eject blood. They are effective long-term to stabilise the patient.
4. **Digitalis glycosides.** These drugs improve heart function in several ways. They regulate excess hormones that have been released, slow the heart rate, and strengthen each contraction of the heart.
5. **Bronchodilators** which help breathing in a fluid compromised lung.

### HOW MUCH LONGER WILL YOUR DOG LIVE?

There are many factors that must be considered before this question can be answered. The results of the tests are important, and the response that occurs within the first few days is another indicator.

If response does not occur within a few hours to days, the prognosis is not good. However, most dogs that stabilise quickly will live for a period of a few months to many months, but the long-term prognosis is not good. It can be difficult to generate an accurate estimate for life-expectancy when a dog has heart disease because many variables impact on survival, not least of which is the dog's activity levels.

